

Bellwork: 5/14/13

Evaluate the following: (use your calculator - no decimals!)

1) $(16)^{\frac{3}{4}}$

8

2) $\left(\frac{1}{36}\right)^{\frac{1}{2}}$

$\frac{1}{6}$

3) $\left(\frac{27}{125}\right)^{\frac{1}{3}}$

$\frac{3}{5}$

4) $(49)^{-\frac{3}{2}}$

$\frac{1}{343}$

Section 7.3 - Logarithmic Functions

Objective: To solve and evaluate logarithmic expressions

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Logarithms: inverse of an exponential equation
(used to solve equations w/ different bases)

☺ With logarithms, you can write an exponential equation in an equivalent logarithmic form.

Exponential Form

$10^3 = 1000$

base: 10

exponent: 3

answer: 1000

Logarithmic Form

$\log_{10} 1000 = 3$

base: 10

*use "swirl method"

$10^3 = 1000$

$\log_{10} 1000 = 3$

Exponential Form

Logarithmic Form

$2^5 = 32$	$\log_2 32 = 5$
$3^{-1} = \frac{1}{3}$	$\log_3 \frac{1}{3} = -1$
$6^2 = 36$	$\log_6 36 = 2$
$16^{\frac{1}{2}} = 4$	$\log_{16} 4 = \frac{1}{2}$
$\left(\frac{1}{64}\right)^{\frac{1}{2}} = \frac{1}{8}$	$\log_{\frac{1}{64}} \frac{1}{8} = \frac{1}{2}$
$5^0 = 1$	$\log_5 1 = 0$
$8^1 = 8$	$\log_8 8 = 1$

Solve for x:

Example 1:

$$\log_5 125 = x$$

$$5^x = 125$$

$$\boxed{x = 3}$$

Example 2:

$$\log_2 x = 4$$

$$2^4 = x$$

$$\boxed{x = 16}$$

Example 3:

$$\log_3 x = -2$$

$$3^{-2} = x$$

$$\boxed{x = \frac{1}{9}}$$

Example 4:

$$\log_4 \frac{1}{16} = x$$

$$4^x = \frac{1}{16}$$

$$\boxed{x = -2}$$

Exercises: Find the value of x :

1) $\log_x 64 = 5$

2) $\log_3 x = 4$

3) $\log_4 64 = x$

4) $\log_x 25 = 2$

5) $\log_3 x = 6$

6) $\log_7 x = 3$

7) $\log_x \frac{1}{8} = 3$

8) $\log_7 1 = x$

9) $\log_x \frac{1}{49} = -2$

$$10) \log_{\frac{1}{2}} 16 = x$$

$$11) \log_5 x = 1$$

$$12) \log_5 \frac{1}{125} = x$$

